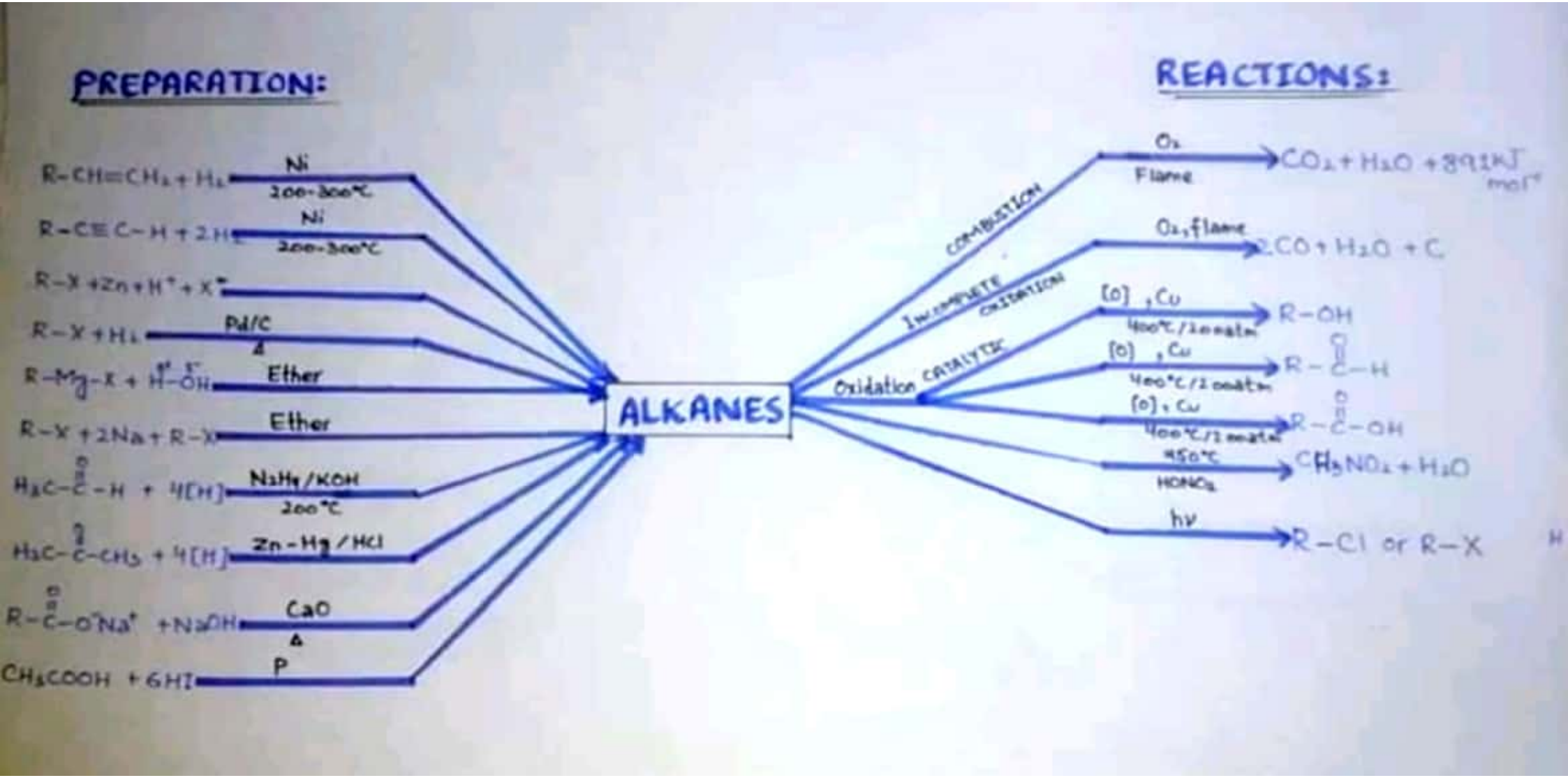

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ALKYNES

PREPARATION:

1. $R-CH(X)-CH(X)-R$ — Dehydrohalogeration of Vicinal dihalides, $-2HX$
2. $H-CBr_2-CBr_2-H + Zn$ — Dehalogenation of tetrahalides
3. $HC-COOK^+$ (unsaturated) $HC-COOK^+$ — Electrolysis of salt of unsaturated dicarboxylic acid
4. $CaO + 3C \xrightarrow{2000^\circ C} CaC_2 + CO$; $CaC_2 + 2H_2$ — Industrial prep. of Ethyne

REACTIONS:

1. $2Na \rightarrow Na^+C\equiv CNa^-$
2. Cu-tube, 300°C → benzene
4. Combustion, O_2 → $CO_2 + H_2O$ + heat
5. Oxidation, (O) → COOH / COOH
6. $CuCl_2/NH_4Cl$, Addition of HCN → $CH_2=CH-CN$
7. Addition of NH_3, Al_2O_3, 300°C → $H_3C-C\equiv N + H_2$
8. Addition of H_2O, $HgSO_4$ & H_2SO_4 → $H_2C=C-O-H \rightleftharpoons H_3C-C(=O)-H$
9. Addition of halogen acid (HBr) → $H_2C=CH-Br \xrightarrow{H-Br} H_3C-CH(Br)-Br$
10. Addition of halogen, CCl_4 → $H-C\equiv C-Cl$ (Cl, H)
11. Addition of Hydrogen, Ni + heat + H_2 → $H_2C=CH_2$

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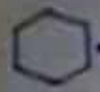
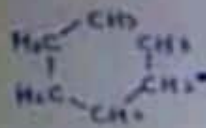
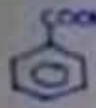
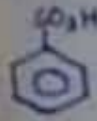
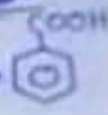
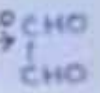
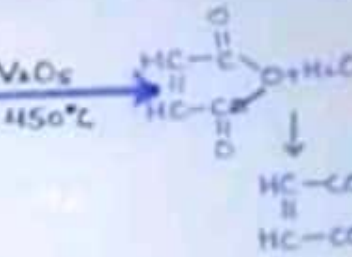
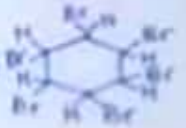
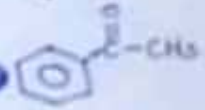
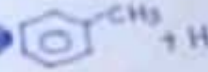
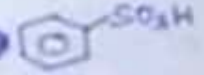
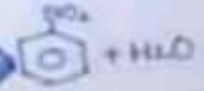
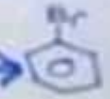
PREPARATION:

1.  "Pt" or "Pd" 250°C
2. $3HC{\equiv}CH$ Organo-Nickle catalyst 80°C
3.  $Cr_2O_3 + Al_2O_3 + SiO_2$ 500°C
4.  $+ NaOH$ CaO
5. $+ Zn$
6.  $+ H_2O$ HCl Boil
7. $+ R\text{-}Br$ 2Na Ether
8. $+ H_3C\text{-}CH_2\text{-}MgBr$ Ether

BENZENE

REACTIONS:

1. $3[O]$ → 
2. $3O_3$ → $C_6H_6O_9$ $\xrightarrow{3H_2O}$ 
3. V_2O_5, 450°C → 
4. $15O_2$ → $CO_2 + H_2O$
5. $h\nu$, $3Br_2$ → 
6. Ni, $3H_2$ →
7. → 
8. $CH_3\text{-}Cl$ →  $+ HCl$
9. H_2SO_4, 80°C → 
10. H_2SO_4 (Sp. Gr. 1.53), HNO_3 →  $+ H_2O$
11. $FeBr_3$, Br_2 → 

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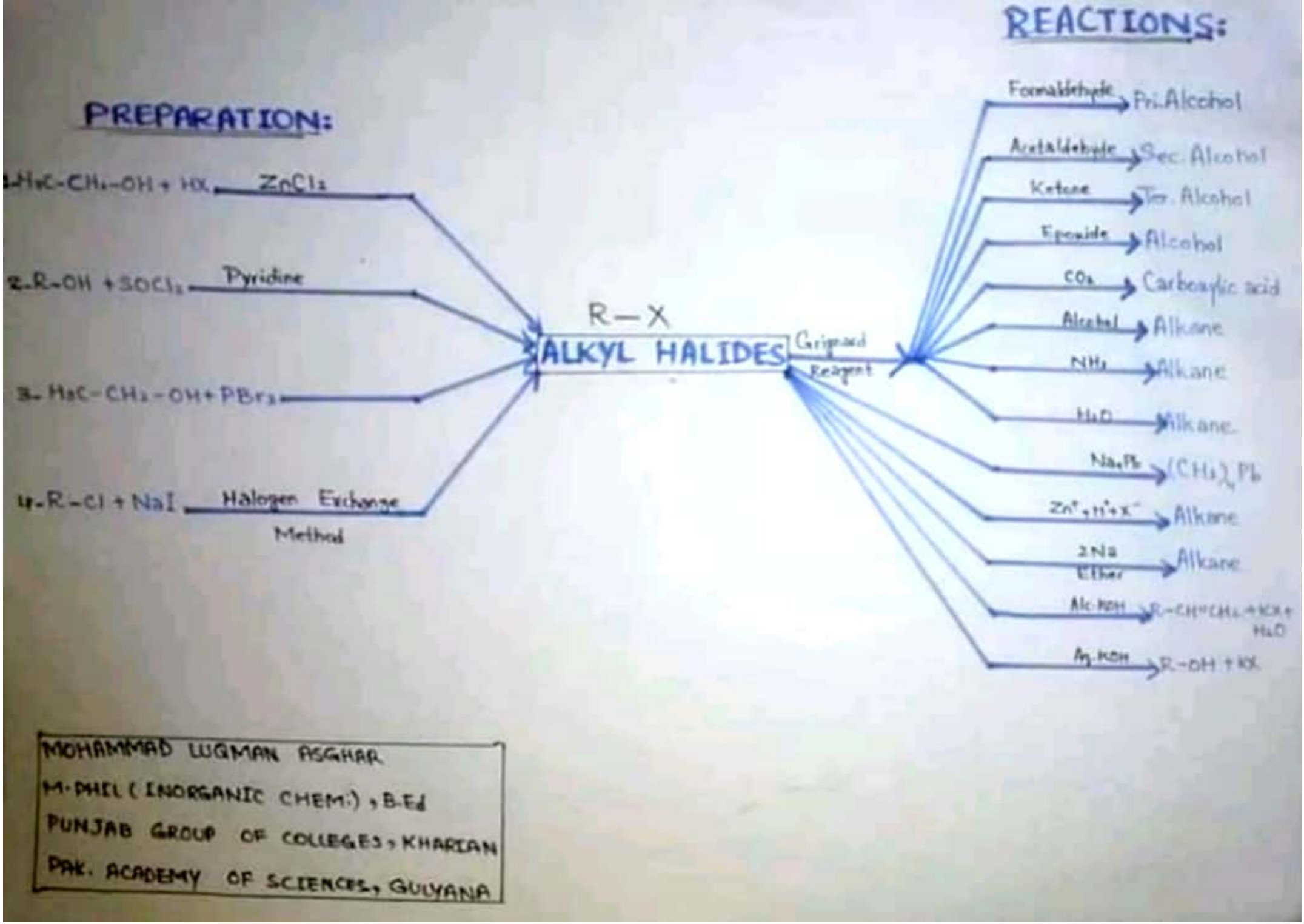

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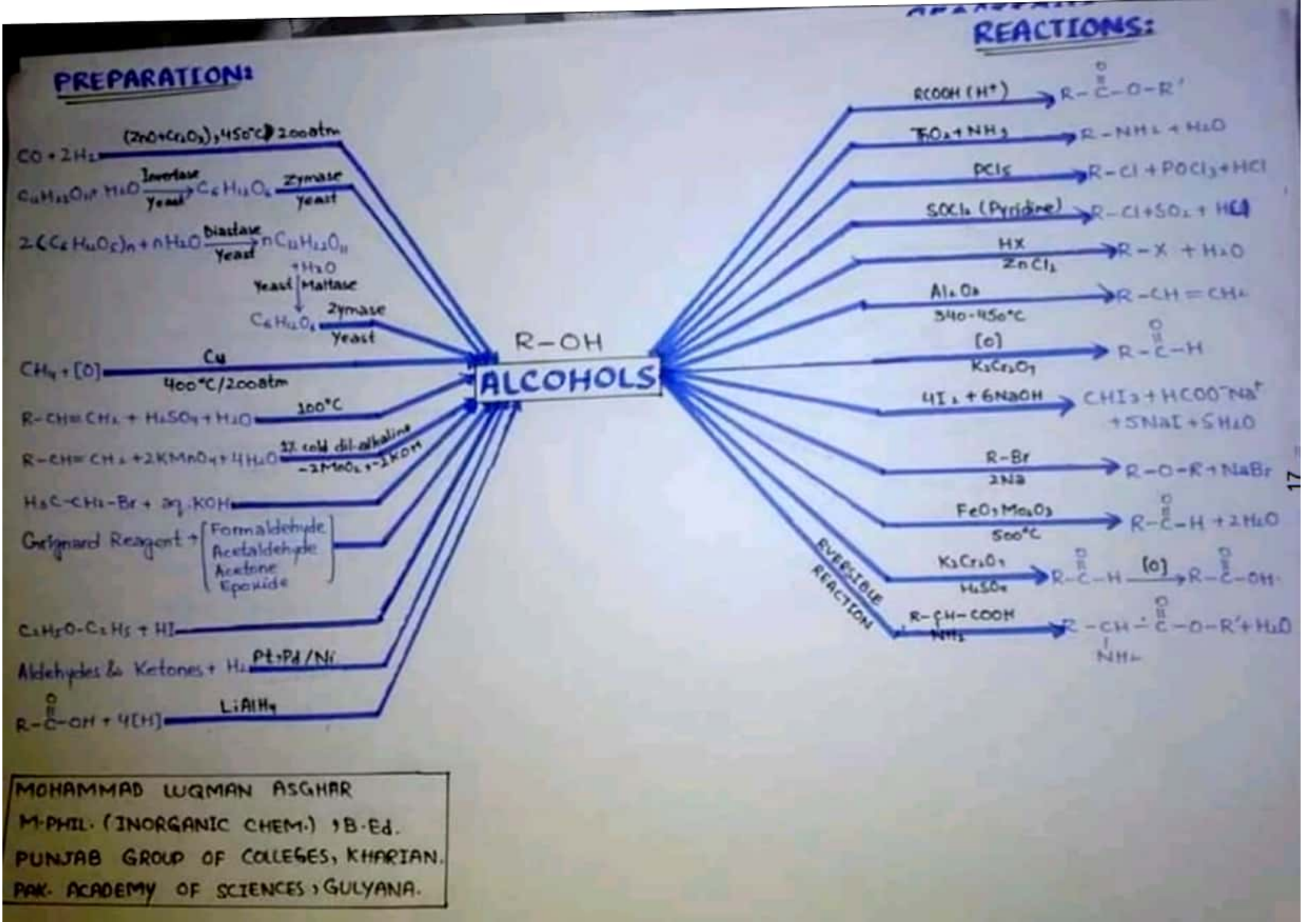

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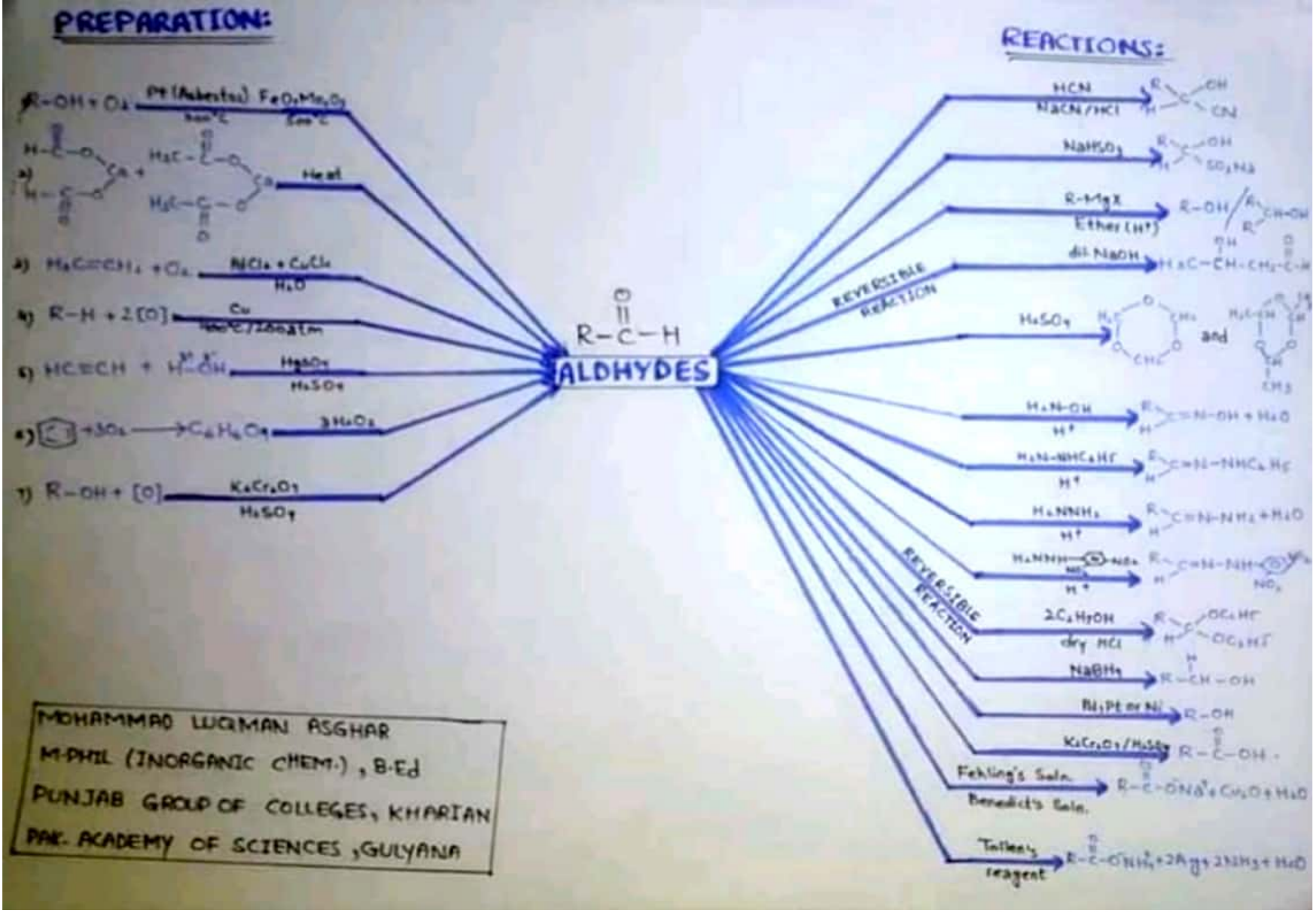

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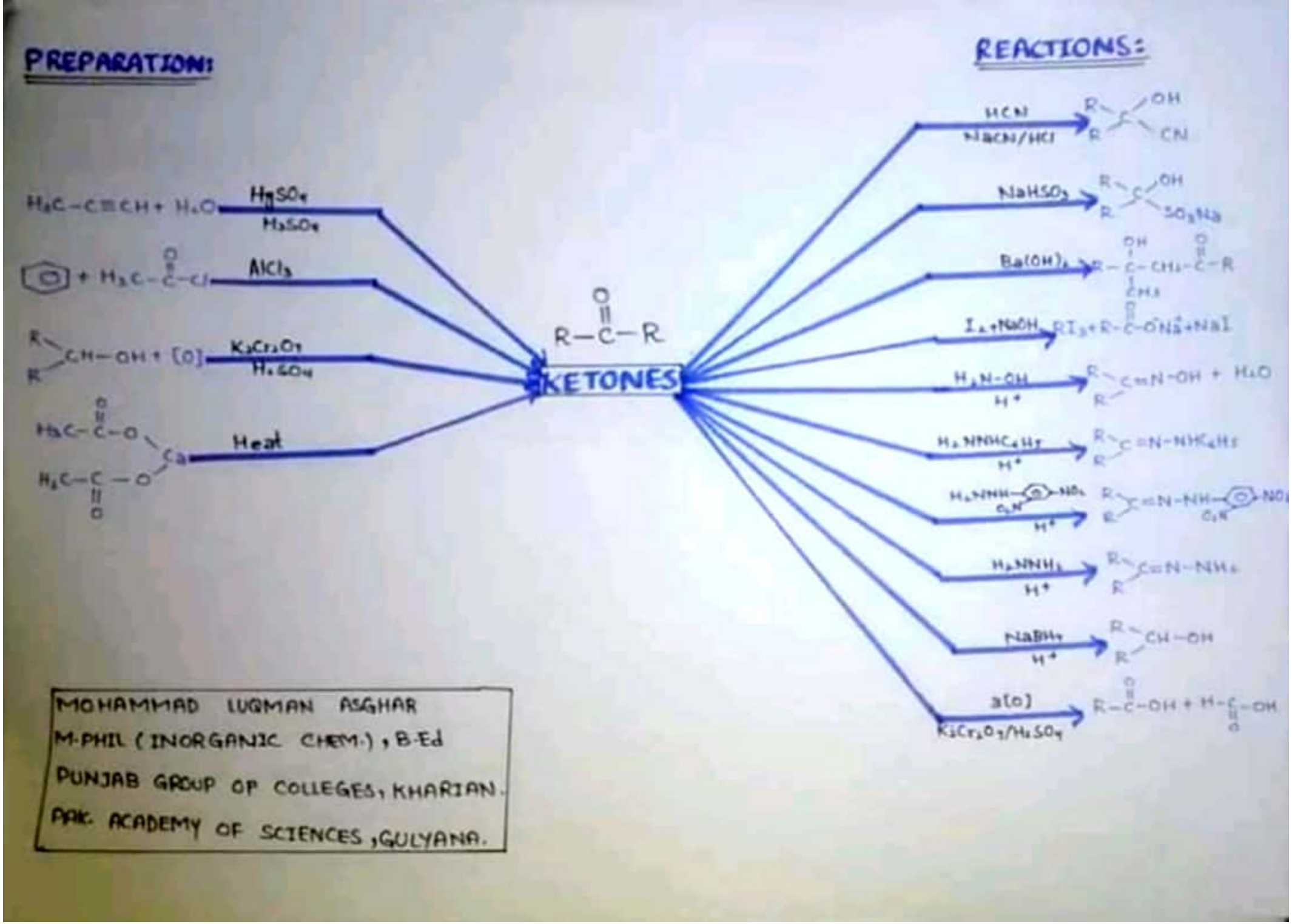

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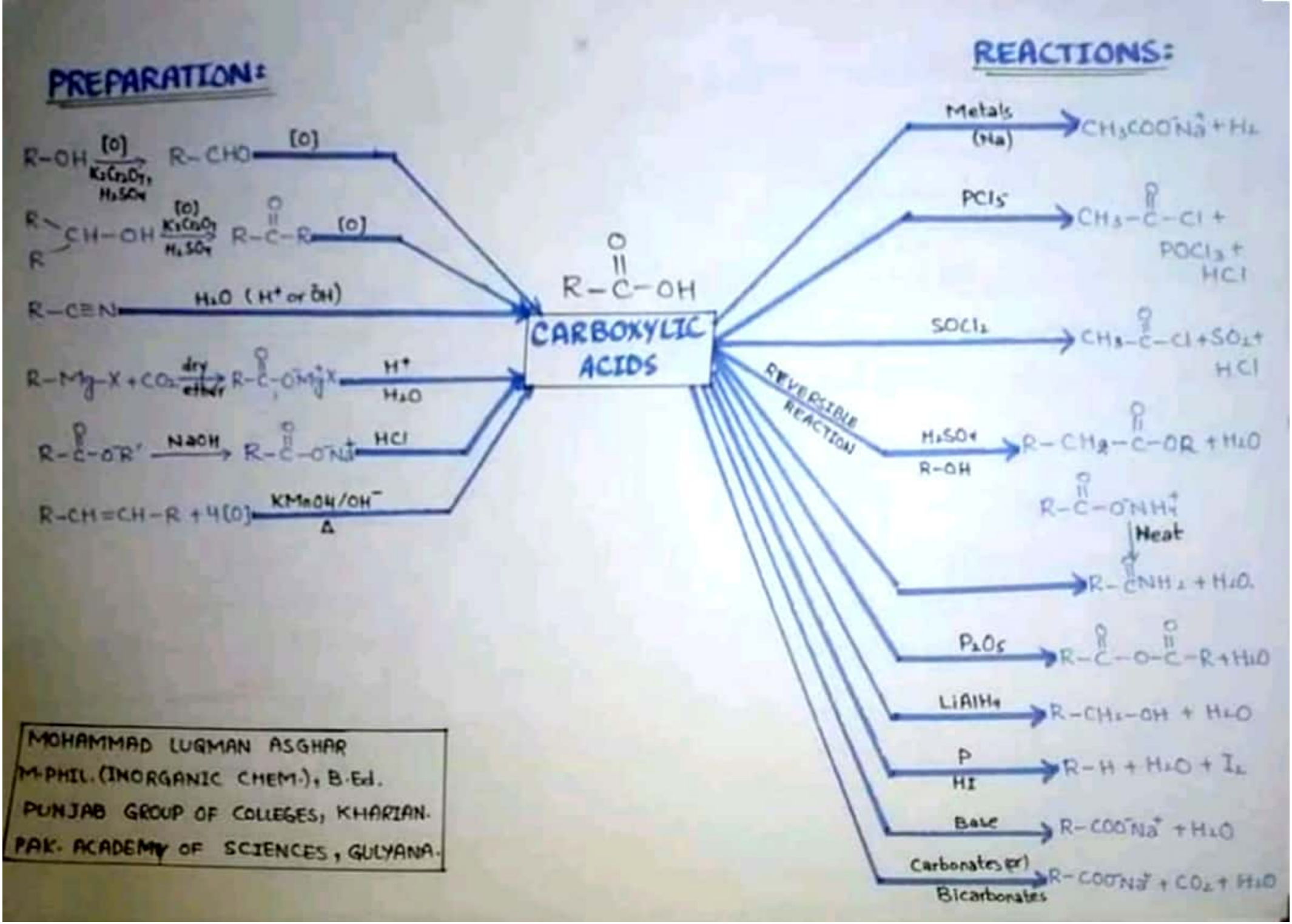
PREPARATION:
REACTIONS:
CARBOXYLIC ACIDS
R-OH [O] K2Cr2O7, H2SO4 R-CHO [O]
R-CH-OH [O] K2Cr2O7 H2SO4 R-C(=O)-R [O]
R-C≡N H2O (H+ or OH-)
R-Mg-X + CO2 dry ether R-C(=O)-OMgX H+ H2O
R-C(=O)-OR' NaOH R-C(=O)-O-Na+ HCl
R-CH=CH-R + 4[O] KMnO4/OH- Δ
Metals (Na) CH3COO-Na+ + H2
PCl5 CH3-C(=O)-Cl + POCl3 + HCl
SOCl2 CH3-C(=O)-Cl + SO2 + HCl
REVERSIBLE REACTION
H2SO4 R-OH R-CH2-C(=O)-OR + H2O
R-C(=O)-O-NH4+ Heat R-C(=O)-NH2 + H2O
P2O5 R-C(=O)-O-C(=O)-R + H2O
LiAlH4 R-CH2-OH + H2O
P HI R-H + H2O + I2
Base R-COO-Na+ + H2O
Carbonates (or) Bicarbonates R-COO-Na+ + CO2 + H2O

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